

Your SELECT statement is:
s (silicon or si) and (smooth? or rough? or roughness) and (heat? or anneal?) (10w) (HCl or hydrochloric or halogen or chlorine or mineral(w)acid)

Items	File
7	2: INSPEC_1969-2002/Mar W1
6	8: Ei Compendex(R) _1970-2002/Mar W1
1	34: SciSearch(R) Cited Ref Sci 1990-2002/Mar W1
2	35: Dissertation Abs Online_1861-2002/Mar
1	73: EMBASE_1974-2002/Feb W4
2	95: TEME-Technology & Management_1989-2002Jan W3
1	103: Energy SciTec 1974-2001/Sep B2
1	144: Pascal_1973-2002/Feb W4
Examined	50 files
6	340: CLAIMS(R)/US Patent 1950-02/Feb 28
6	347: JAPIO_Oct/1976-2001/Oct (Updated 020204)

Processing
434 348: EUROPEAN PATENTS_1978-2002/Feb W03

Status: Break Sent.

?b 2,8,35,144
04mar02 20:30:39 User264704 Session D101.2
\$8.20 4.685 DialUnits File411
\$8.20 Estimated cost File411
\$0.46 TYMNET
\$8.66 Estimated cost this search
\$8.67 Estimated total session cost 4.913 DialUnits

SYSTEM:OS - DIALOG OneSearch
File 2:INSPEC 1969-2002/Mar W1
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File 8:Ei Compendex(R) 1970-2002/Mar W1
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File 35:Dissertation Abs Online 1861-2002/Mar
(c) 2002 ProQuest Info&Learning
File 144:Pascal 1973-2002/Feb W4
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Set Items Description

?s (silicon or si) and (smooth? or rough? or roughness) and (heat? or anneal?) (10w) (HCl or hydrochloric or halogen or chlorine or mineral(w)acid)
619293 SILICON
592594 SI
212867 SMOOTH?
175782 ROUGH?
82546 ROUGHNESS
1143459 HEAT?
268276 ANNEAL?
41812 HCL
18293 HYDROCHLORIC
22713 HALOGEN
74842 CHLORINE
586770 MINERAL
737869 ACID
452 MINERAL(W)ACID
1639 (HEAT? OR ANNEAL?) (10W) (((HCL OR HYDROCHLORIC) OR HALOGEN) OR CHLORINE) OR MINERAL(W)ACID
S1 16 (SILICON OR SI) AND (SMOOTH? OR ROUGH? OR ROUGHNESS) AND (HEAT? OR ANNEAL?) (10W) (HCL OR HYDROCHLORIC OR HALOGEN OR CHLORINE OR MINERAL(W)ACID)
?rd
...completed examining records
S2 13 RD (unique items)

SYSTEM:OS - DIALOG OneSearch

File 2:INSPEC 1969-2002/Mar W1
(c) 2002 Institution of Electrical Engineers
File 8:Ei Compendex(R) 1970-2002/Mar W1
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File 94:JICST-EPlus 1985-2002/Jan W2
(c) 2002 Japan Science and Tech Corp (JST)

*File 94: There is no data missing. UDs have been adjusted to reflect the current months data. See Help News94 for details.

File 144:Pascal 1973-2002/Feb W4
(c) 2002 INIST/CNRS

Set Items Description

>>>One or more prefixes are unsupported
>>> or undefined in one or more files.

Processing

>>>File 144 processing for PD= : PD=19990421
>>> started at PD=18019 stopped at PD=19831112

Processing

28314541 PY<2000

5108879 PD<19990421

685989 SILICON

612991 SI

1363887 HEAT?

280070 ANNEAL?

43922 HCL

22422 HYDROCHLORIC

178098 CHLORINE

542866 HYDROGEN

1276169 H

5651159 2

296342 H(2W)2

52 (SILICON OR SI)(3N)(HEAT? OR ANNEAL?)(10N)((HCL OR
HYDROCHLORIC) OR CHLORINE)(10N)(HYDROGEN OR H(2W)2)

S1 50 (PY<2000 OR PD<19990421) AND (SILICON OR SI)(3N)(HEAT? OR
ANNEAL?)(10N)(HCL OR HYDROCHLORIC OR
CHLORINE)(10N)(HYDROGEN OR H(2W)2)

?rd

...examined 50 records (50)

...completed examining records

S2 42 RD (unique items)

2/9/26 (Item 3 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
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04360866 E.I. No: EIP96033103466

Title: Microstructural properties of helium implanted void layers in silicon as related to front-side gettering

Author: Medernach, J.W.; Hill, T.A.; Myers, S.M.; Headley, T.J.

Corporate Source: Sandia Natl Lab, Albuquerque, NM, USA

Source: Journal of the Electrochemical Society v 143 n 2 Feb 1996. p 725-735

Publication Year: 1996

CODEN: JESOAN ISSN: 0013-4651

Language: English

Document Type: JA; (Journal Article) Treatment: A; (Applications); X;
(Experimental)

Journal Announcement: 9605W2

Abstract: A novel gettering concept uses helium ion implantation and low temperature annealing to form a void layer below the surface of the silicon. The surface of the void walls contains many dangling voids that are highly reactive. Similarly the use of an in situ H // 2 - HCl etch during epitaxial silicon growth is destructive. Evidence suggests that hydrogen diffuses into the voids and passivates them during wet oxidation. This study evaluates the high temperature stability of the void microstructure formed during wet and dry oxidation processes together with silicon epitaxial growth at different temperatures. Dislocation behavior essential to the use of voids for gettering is discussed. A discussion of void electrical charging by available dangling bonds is presented for lightly doped and heavily doped n-type silicon. 19 Refs.

1P250, A54j

2/9/6 (Item 6 from Issue: 2)

DIALOG(R) File 2:INSPEC

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04338933 INSPEC Abstract Number: A9306-8160C-009, B9303-2550E-035

Title: A simple process for removing residual fluorine and chlorine on silicon surface by low temperature annealing in hydrogen ambient

Author(s): Saito, Y.; Yoshida, A.

Author Affiliation: Dept. of Electr. Eng. & Electron., Seikei Univ., Musashino, Japan

Journal: Journal of the Electrochemical Society vol.139, no.12 p. L115-17

Publication Date: Dec. 1992 Country of Publication: USA

CODEN: JESOAN ISSN: 0013-4651

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Plasmaless dry cleaning process of silicon surface has been investigated with in situ Auger electron spectroscopy measurements. Usually, etching with halogen gas leaves residual halogen species on the substrate in spite of removing the native oxide. Annealing above 700 degrees C is required for the removal of the residual fluorine and chlorine atoms on the silicon substrate in ultrahigh vacuum. The authors have found that hydrogen gas at a pressure of about 10^{-5} Torr accelerates remarkably the desorption of the residual chlorine and fluorine. The desorption rate greatly depends on the hydrogen pressure. The fluorine and chlorine can be completely removed by annealing above 300 degrees C at 5×10^{-5} Torr. (10 Refs)

TP250. A54

2/9/13 (Item 13 from file: 2)

DIALOG(R) File 2:INSPEC

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02048873 INSPEC Abstract Number: B83029979

7

Title: Silicon substrate with large defect-free zone for high device yield

Author(s): Ahlgren, D.C.; Das, G.

Author Affiliation: IBM Corp., Armonk, NY, USA

Journal: IBM Technical Disclosure Bulletin vol.25, no.8 p.4412

Publication Date: Jan. 1983 Country of Publication: USA

CODEN: IBMTAA ISSN: 0018-8689

Language: English Document Type: Journal Paper (JP)

Treatment: Applications (A); Practical (P); Experimental (X)

Abstract: The process consists of annealing silicon wafers at a sufficiently high temperature greater than 1150 degrees C in dry oxygen in the presence of hydrogen chloride (HCl). (0 Refs)

Subfile: B

Descriptors: annealing; elemental semiconductors; semiconductor technology; silicon

Identifiers: Si wafers; elemental semiconductors; high temperature technique; dry O₂; defect-free zone; high device yield; annealing

Class Codes: B2520C (Elemental semiconductors); B2550E (Surface treatment and oxide film formation)

2/9/23 (Item 23 from file: 2)
DIALOG(R) File 2:INSPEC

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00108824 INSPEC Abstract Number: A70018356, B70010588

Title: C-V characteristics of MOS diodes prepared by SiH₄/NO₂/system

Author(s): Haneta, Y.

Author Affiliation: Nippon Electric Co., Ltd., Kawasaki, Japan

Journal: Japanese Journal of Applied Physics vol.8, no.7 p.929-34

Publication Date: July 1969 Country of Publication: Japan

CODEN: JJAPA5 ISSN: 0021-4922

Language: English Document Type: Journal Paper (JP)

Abstract: Properties at the Si-SiO₂ interface associated with vapor deposited SiO₂ films at low temperature were studied experimentally using the MOS diodes. SiO₂ films were deposited on the n-type silicon substrates by the reaction of SiH₄ with NO₂ at a temperature of 450 degrees C. The effects of surface treatment of silicon substrate prior to deposition, substrate orientation, and electric stress in MOS diodes were examined, as well as the location of the surface states. The results indicate that the properties at the Si-SiO₂ interface of MOS diodes prepared by this method are different from those of MOS diodes obtained from thermally grown SiO₂ films, that is, no orientation dependence of the surface charge density was observed, and the surface treatments of substrate prior to deposition influenced remarkably on surface charge density. It was found that the surface treatments of silicon in an H₂O₂ solution and annealing in hydrogen after vapor etching with HCl are effective to obtain a smaller surface charge density. The surface state density is calculated from the theoretical and experimental C-V (capacitance-voltage) curves measured at high frequency and discussed.

Subfile: A B

2/9/30 (Item 7 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
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02941452 E.I. Monthly No: EI9008096779

Title: Influence of the chlorine-hydrogen ratio in the gas phase on the stability of the left brace 113 right brace faces of silicon in Si-H-Cl CVD.

Author: Gardeniers, J. G. E.; Mooren, M. M. W.; De Croon, M. H. J. M.; Giling, L. J.

Corporate Source: Univ of Nijmegen, Nijmegen, Neth

Source: Journal of Crystal Growth v 102 n 1-2 Apr 2 1990 p 233-244

Publication Year: 1990

CODEN: JCRGAE ISSN: 0022-0248

Language: English

Document Type: JA; (Journal Article) Treatment: X; (Experimental)

Journal Announcement: 9008

Abstract: The orientation dependence of silicon crystal growth in the Si-H-Cl CVD system has been studied as a function of the chlorine-hydrogen ratio of the gas phase. This was done by the use of hemispherical single crystal substrates. As was reported before, the stability of faces with the indices left brace $h\bar{k}$ right brace // $h\bar{k}$ // less than // k is dependent on temperature: above a certain critical temperature flat left brace 113 right brace and left brace 337 right brace faces are found on the hemispheres, while below this temperature only macroscopic steps appear in positions corresponding to these faces. In this study it is found that the above-mentioned critical temperature is strongly dependent on the chlorine-hydrogen ratio in the gas phase. It will be demonstrated that this 'chemical roughening' effect is caused by the competitive adsorption of chlorine and **hydrogen**. From the experimental dependencies values for the **heat** of chemisorption of **chlorine** and **hydrogen** can be derived. These values are in good agreement with literature values of **Si -Cl** and **Si -H** bond strengths. (Edited author abstract) 35 Refs.

Descriptors: *SEMICONDUCTING SILICON--*Chemical Vapor Deposition; CHLORINE; HYDROGEN; CRYSTALS--Orientation

Identifiers: SINGLE CRYSTALS; HYDROGEN BONDS

Classification Codes:

712 (Electronic & Thermionic Materials); 549 (Nonferrous Metals & Alloys); 531 (Metallurgy & Metallography); 802 (Chemical Apparatus & Plants); 804 (Chemical Products)

71 (ELECTRONICS & COMMUNICATIONS); 54 (METAL GROUPS); 53 (METALLURGICAL ENGINEERING); 80 (CHEMICAL ENGINEERING)

Order ?

2/9/1 (Item 1 from file 2)

DIALOG(R) File 2:INSPEC

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6381136 INSPEC Abstract Number: A1999-22-8265-017

Title: Chlorine extraction by atomic hydrogen on Si(111)-7*7 surfaces

Author(s): Iimori, T.; Hattori, K.; Shudo, K.; Komori, F.

Author Affiliation: Inst. for Solid State Phys., Tokyo Univ., Japan

Journal: Surface Science vol.437, no.1-2 p.86-90

Publisher: Elsevier,

Publication Date: 20 Aug. 1999 Country of Publication: Netherlands

CODEN: SUSCAS ISSN: 0039-6028

SICI: 0039-6028(19990820)437:1/2L.86:CEAH;1-8

Material Identity Number: S076-1999-027

U.S. Copyright Clearance Center Code: 0039-6028/99/\$20.00

Document Number: S0039-6028(99)00688-3

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: We have studied atomic-hydrogen-induced chlorine extraction on Si(111)-7*7 surfaces using photoemission spectroscopy and scanning tunneling microscopy (STM). We exposed the surface with mono- and polychloride Si to atomic **hydrogen** at room temperature. Photoemissions from Si 2p core level and Cl 3s level were measured before and after the atomic **hydrogen** dosage on the surfaces. Signals with both **silicon**-chlorides and Cl atoms decrease with increasing atomic **hydrogen** dosage. After **annealing** the **hydrogen**-exposed surface at 720 K, the STM images are very different from those of **chlorine** adsorbed Si (111) surface, and similar to those of **hydrogen**-covered Si (111) surfaces after the **annealing**. We conclude that **chlorine** atoms are extracted from the Cl/Si (111) surface by atomic **hydrogen**, and the surface Si atoms are terminated by hydrogens. (19 Refs)

X

2/9/4 (Item 4 from file 2)

DIALOG(R) File 2:INSPEC

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5990814 INSPEC Abstract Number: A9818-8265-009

Title: Hydrogen-chlorine exchange reaction on Si(111)-7*7 studied with STM

Author(s): Hattori, K.; Shudo, K.; Ueta, M.; Iimori, T.; Komori, F.

Author Affiliation: Inst. for Solid State Phys., Tokyo Univ., Japan

Journal: Surface Science Conference Title: Surf. Sci. (Netherlands)

vol.402-404 p.170-3

Publisher: Elsevier,

Publication Date: 15 May 1998 Country of Publication: Netherlands

CODEN: SUSCAS ISSN: 0039-6028

SICI: 0039-6028(19980515)402/404L.170:HCER;1-L

Material Identity Number: S076-98015

U.S. Copyright Clearance Center Code: 0039-6028/98/\$19.00

Conference Title: 17th European Conference on Surface Science. ECOSS-17

Conference Date: 16-19 Sept. 1997 Conference Location: Enschede, Netherlands

Document Number: S0039-6028(97)00965-5

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Experimental (X)

Abstract: We have studied **hydrogen** and **chlorine** exchange reaction on **Si (111)-7*7** surfaces with STM. We found that atomic **hydrogen** extracts **chlorine** from a monochloride rest-layer surface, while molecular **chlorine** would not react with a monohydride rest-layer surface. Multi-bilayer pits are found on **hydrogen** -saturated surfaces followed by Cl dose and annealing . (24 Refs)

Subfile: A

2/9/24 (Item 1 from File: 8)
DIALOG(R) File 8: Ei Compendex(R)
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05420204 E.I. No: EIP99114909038

Title: Chlorine extraction by atomic hydrogen on Si(111)-7 multiplied by 7 surfaces

Author: Iimori, T.; Hattori, K.; Shudo, K.; Komori, F.

Corporate Source: Univ of Tokyo, Tokyo, Jpn

Source: Surface Science v 437 n 1 1999. p 86-90

Publication Year: 1999

CODEN: SUSCAS ISSN: 0039-6028

Language: English

Document Type: JA; (Journal Article) Treatment: X; (Experimental)

Journal Announcement: 0001W2

Abstract: We have studied atomic-hydrogen-induced chlorine extraction on Si(111)-7 multiplied by 7 surfaces using photoemission spectroscopy and scanning tunneling microscopy (STM). We exposed the surface with mono- and polychloride Si to atomic hydrogen at room temperature. Photoemissions from Si 2p core level and Cl 3s level were measured before and after the atomic hydrogen dosage on the surfaces. Signals with both silicon-chlorides and Cl atoms decrease with increasing atomic hydrogen dosage. After annealing the hydrogen-exposed surface at 720 K, the STM images are very different from those of chlorine adsorbed Si(111) surface, and similar to those of hydrogen-covered Si(111) surfaces after the annealing. We conclude that chlorine atoms are extracted from the Cl/Si(111) surface by atomic hydrogen, and the surface Si atoms are terminated by hydrogens. (Author abstract) 19 Refs.

SYSTEM:OS - DIALOG OneSearch
File 2:INSPEC 1969-2002/Mar W1
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File 8:Ei Compendex(R) 1970-2002/Mar W1
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File 94:JICST-EPlus 1985-2002/Jan W2
(c) 2002 Japan Science and Tech Corp (JST)
***File 94: There is no data missing. UDs have been adjusted to reflect the current months data. See Help News94 for détails.**
File 144:Pascal 1973-2002/Feb W4
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Set Items Description

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?s (py<2000 or pd<19990421) and (silicon or si) (2w) (heat? or anneal?) (10w) (HCl or hydrochloric or halogen or chlorine or mineral(w)acid)

>>>One or more prefixes are unsupported

>>> or undefined in one or more files.

Processing

>>>File 144 processing for PD= : PD=19990421
>>> started at PD=18019 stopped at PD=19831112

Processing

28314541	PY<2000
5108879	PD<19990421
685989	SILICON
612991	SI
1363887	HEAT?
280070	ANNEAL?
43922	HCL
22422	HYDROCHLORIC
173863	HALOGEN
178098	CHLORINE
636342	MINERAL
1083257	ACID
465	MINERAL(W)ACID
38	(SILICON OR SI) (2W) (HEAT? OR ANNEAL?) (10W) (((HCL OR HYDROCHLORIC) OR HALOGEN) OR CHLORINE) OR MINERAL(W)ACID)
S1 34	(PY<2000 OR PD<19990421) AND (SILICON OR SI) (2W) (HEAT? OR ANNEAL?) (10W) (HCL OR HYDROCHLORIC OR HALOGEN OR CHLORINE OR MINERAL(W)ACID)

?rd

...completed examining records

S2 24 RD (unique items)

2/9/2 (Item 2 from file: 2)

DIALOG(R) File 2:INSPEC

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5490535 INSPEC Abstract Number: B9703-2550E-031

Title: Influence of HCl on rapid thermal oxides

Author(s): Hames, G.A.; Beck, S.E.; Gilicinski, A.G.; Henson, W.K.; Wortman, J.J.

Author Affiliation: Texas Instrum. Inc., Dallas, TX, USA

Conference Title: Rapid Thermal and Integrated Processing V. Processing p.219-24

Editor(s): Gelpey, J.C.; Ozturk, M.C.; Thakur, R.P.S.; Fiory, A.T.; Roozeboom, F.

→ Publisher: Mater. Res. Soc, Pittsburgh, PA, USA

→ Publication Date: 1996 Country of Publication: USA xi+389 pp.

Material Identity Number: XX96-03541

Conference Title: Rapid Thermal and Integrated Processing V. Symposium

Conference Date: 8-12 April 1996 Conference Location: San Francisco, CA, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Practical (P); Experimental (X)

Abstract: The influence of HCl on the quality of gate oxides grown by rapid thermal oxidation has been investigated. HCl was added to the oxidation ambient for some rapid thermal oxides while for others the silicon surface was annealed in a partial HCl ambient prior to rapid thermal oxidation. Improvements in gate oxide integrity were monitored on MOS capacitors and MOSFET devices by I-V and C-V testing. The levels of chlorine incorporated in the oxide from the addition of HCl to the process was measured by secondary ion mass spectroscopy. Atomic force microscopy was performed to measure surface roughening during HCl pre-oxidation treatments. (9 Refs)

Subfile: B

| A

2/9/6 (Item 6 from file: 2)

DIALOG(R) File 2:INSPEC

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03825840 INSPEC Abstract Number: A91036202

Title: Reverse diffusion of gold and iron in silicon during heat treatment in oxygen+chlorine medium

Author(s): Moiseenkova, T.V.; Svistel'nikova, T.P.; Stuk, A.A.; Alontsev, S.A.; Kharchenko, V.A.

Author Affiliation: L. Ya. Karpov Physicochem. Sci.-Res. Inst., Moscow, USSR

Journal: Izvestiya Akademii Nauk SSSR, Neorganicheskie Materialy vol.26, no.1 p.5-8

Publication Date: Jan. 1990 Country of Publication: USSR

CODEN: IVNMAW ISSN: 0002-337X

Translated in: Inorganic Materials vol.26, no.1 p.1-3

Publication Date: Jan. 1990 Country of Publication: USA

CODEN: INOMAF ISSN: 0020-1685

U.S. Copyright Clearance Center Code: 0020-1685/90/2601-0001\$12.50

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Radioactive isotopes are used to demonstrate that gold and iron diffuse out of the single crystal bulk under the influence of chemical processes occurring on the surface of doped silicon during heat treatment in a chlorine -containing atmosphere. The lifetime of nonequilibrium charge carriers in silicon increases as a result. (5 Refs)

X

2/9/14 (Item 14 from file: 2)

DIALOG(R) File 2:INSPEC

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01268458 INSPEC Abstract Number: A78088550, B78049735

Title: **Elimination of stacking-fault formation in silicon by preoxidation annealing in N₂//HCl/O₂ mixtures**

Author(s): Hattori, T.; Suzuki, T.

Author Affiliation: Sony Corp. Res. Center, Yokohama, Japan

Journal: Applied Physics Letters vol.33, no.4 p.347-9

Publication Date: 15 Aug. 1978 Country of Publication: USA

CODEN: APPLAB ISSN: 0003-6951

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P)

Abstract: The formation of oxidation-induced stacking faults in the surface regions of silicon wafers can be eliminated by a short-period anneal in a dry nitrogen atmosphere containing small concentrations of HCl and oxygen in the same furnace where subsequent oxidation will be carried out. This preoxidation anneal results in the prevention of fault nucleation without causing any problem like a nitridation reaction, an etch-pit formation, and a blotchy appearance on the silicon surface. (10 Refs)

Subfile: A B

Descriptors: annealing; elemental semiconductors; oxidation; silicon; stacking faults

Identifiers: preoxidation annealing; N₂//HCl/O₂ mixtures; elimination of stacking fault formation; Si; elemental semiconductor; oxidation induced stacking faults

Class Codes: A6170P (Stacking faults, stacking fault tetrahedra and other planar or extended defects); A8160C (Semiconductors); B2520C (Elemental semiconductors); B2550E (Surface treatment and oxide film formation)

2/9/18 (Item 4 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
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03957072 E.I. No: EIP94101422810

Title: Effects of halogen-containing gas plasma and rapid thermal anneal treatment on the reactive ion etched silicon

Author: Kwon, Kwang-Ho; Kim, Bo-Woo; Park, Hyung-Ho; Kang, Jin-Yeong; Yeom, Gun-Yung

Corporate Source: ETRI, Suwon, South Korea

Conference Title: Proceedings of the 1993 Fall Meeting of the Materials Research Society

Conference Location: Boston, MA, USA Conference Date: 19931129-19931202

Sponsor: ASTeX (Applied Science and Technology); Digital Instruments, Inc.; MKS Instruments, Inc.; Naval Research Laboratory; Office of Naval Research

E.I. Conference No.: 20875

Source: Diagnostic Techniques for Semiconductor Materials Processing Materials Research Society Symposium Proceedings v 324 1994. Publ by Materials Research Society, Pittsburgh, PA, USA. p 481-486

Publication Year: 1994

CODEN: MRSPDH ISSN: 0272-9172 ISBN: 1-55899-223-5

Language: English

Document Type: CA; (Conference Article) Treatment: A; (Applications); G ; (General Review); X; (Experimental)

Journal Announcement: 9411W4

Abstract: The effects of SF//6 and NF//3 gas plasma treatments, and successive rapid thermal anneal (RTA) treatment for the recovery of modified silicon surface due to CHF//3/C//2F//6 plasma have been investigated using X-ray photoelectron spectroscopy (XPS) and secondary ion mass spectrometry (SIMS). XPS analyses have revealed that NF//3 and SF//6 plasma treatments are effective for the removal of residue layer. SIMS results show that penetrated impurities in the contaminated silicon substrate reduce through the additional RTA treatment. The effects of NF//3, SF//6 plasmas, and additional RTA treatments for the recovery of reactive ion etched silicon surface has been also studied by measuring the electrical performance of the silicon devices. (Author abstract) 8 Refs.

Descriptors: Semiconducting silicon; Etching; Surfaces; Annealing; Thermal effects; Plasma applications; Halogen compounds; X ray spectroscopy; Photoelectron spectroscopy; Mass spectrometry

X

2/9/17 (Item 3 from issue: 8)
DIALOG(R)File 8: Ei Compendex(R)
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03993030 E.I. No: EIP94112439437

Title: Study of selectivity in silicon selective epitaxial growth

Author: Ye, Liang; Armstrong, B.M.; Gamble, H.S.

Corporate Source: Queen's Univ of Belfast, Belfast, UK

Conference Title: Proceedings of the 1993 Symposium D on Integrated Processing for Micro and Optoelectronics of the 1993 E-MRS Spring Meeting Conference

Conference Location: Strasbourg, Fr Conference Date: 19930504-19930507

E.I. Conference No.: 21266

Source: Microelectronic Engineering v 25 n 2-4 Aug 1994. p 153-158

Publication Year: 1994

CODEN: MIENEF ISSN: 0167-9317

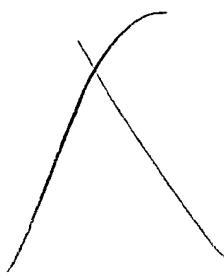
Language: English

Document Type: JA; (Journal Article) Treatment: A; (Applications); X; (Experimental)

Journal Announcement: 9501W2

Abstract: Selective epitaxial silicon layers have been grown in a rapid thermal processing reactor, using dichlorosilane (DCS) diluted in H₂/2, either at millibar low pressure or at a reduced DCS flow. The selective epitaxial growth (SEG) occurs under conditions of near thermodynamic equilibrium. Thus equilibrium partial pressures of the predominant species in the Si-H-Cl system have been calculated to give an insight into the experimental results. The ratio of HCl species relative to silicon containing species in the gas phase, P_H/P_{Cl}, determines reaction system selectivity, while the product of system supersaturation and P_H/P_{Cl} ratio indicates system growth capability. (Author abstract) 7 Refs.

Descriptors: Semiconductor growth; Epitaxial growth; Semiconducting silicon; Heat treatment; Thermodynamics; Silanes; Hydrochloric acid; Hydrogen



2/9/23 (Item 1 from Page: 144)
DIALOG(R) File 144:Pascal
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12790090 PASCAL No.: 97-0001549

On the role of chlorine in selective silicon epitaxy by chemical vapor deposition

VIOLETTE K E; O'NEIL P A; OEZTUERK M C; CHRISTENSEN K; MAHER D M

Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, North Carolina 27695-7911, United States; Department of Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina 27695-7911, United States

Journal: Journal of the Electrochemical Society, 1996, 143 (10)

3290-3296

ISSN: 0013-4651 CODEN: JESOAN Availability: INIST-4925;
354000066738270490

No. of Refs.: 29 ref.

Document Type: P (Serial) ; A (Analytic)

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Si thermal etching studies have been performed using pure Cl SUB 2 in an ultrahigh vacuum rapid thermal chemical vapor deposition reactor in the temperature range of 650-850 Degree C and the flow rate range of 1-10 sccm which corresponds to a pressure range of 0.5-3.5 mTorr. The effects of temperature and Cl SUB 2 flow were investigated with thermodynamic equilibrium calculations performed to determine possible reaction pathways. The effect of a ding H SUB 2 , up to 500 sccm. on Si etch rates at 800 and 850 Degree C was also obtained experimentally. Thermodynamic equilibrium calculations were used to support the experimental results and determine the reaction by-products. It is proposed that SiCl SUB 2 equilibrium partial pressure can be used as a means to compare the etching ability, thus the selectivity, of different selective Si processes. The results from the etching studies were used to explain the behavior of Si epitaxy growth rate from the Si SUB 2 H SUB 6 , H SUB 2 , and Cl SUB 2 system in the 650-850 Degree C, 22-24 mTorr processing regime. The implications of the etching studies for selective silicon epitaxy with the Si SUB 2 H SUB 6 and Cl SUB 2 chemistry are discussed and then extended to the SiH SUB 2 Cl SUB 2 based chemistry.